

The FHWA FAF multimodal freight methodology continues to be improved every year, and it can be used as a comparative benchmark for any purchased data. If the comparisons are good, future multimodal network models could revert to the no-cost federal database, perhaps refined by operations research tools available at NCSU.

In the event that public domain FAF2 data must be used instead of purchased data, it is recommended that trip generation rates specific to North Carolina be developed by conducting a trip generation study in the state or by borrowing trip generation rates from other states similar to North Carolina.

#### *NC Truck Trip Assignment*

The North Carolina truck network model does not include the passenger vehicle component in the total truck assignment (the sum of the FAF2 long haul trucks and the short haul truck trips). Hence, the multi-path stochastic assignment technique is chosen for assigning the truck trips where all truck trips between an O-D pair get assigned to the few shortest paths. The shortest paths are determined by knowing the length of each link and assumed link speeds. Future models should include the passenger car component. Then as most states do for statewide models use the all-or-nothing assignment technique to preload trucks and a static equilibrium technique to assign trucks and passenger vehicles together under capacity constraint. This implies including capacity characteristics to the network in addition to, or in place of, the link speed information currently used.

#### *NC Truck Trip Generation Rates*

Short haul truck traffic in North Carolina is estimated based on employment (0.1 truck trips/employee/day). This total average rate does not recognize individual NAICS employment categories. The rate is close to the lower end of the rates reported for some U.S. cities. Because the rate is a state average, it does not explicitly reflect intense truck activity such as that experienced at trucking hubs. This limitation is due to the aggregation of truck activity locations into counties and metropolitan areas, as they serve as traffic analysis zones (TAZs) in this model. Future versions of the model should carefully develop truck trip rates that reflect NAICS employment categories within TAZs.

#### *Future Year Forecasts*

The base year for the North Carolina truck network model is 2006. Follow-on efforts must determine extrapolations of the base year model to future year traffic in order to examine future highway deficiencies and test alternative highway improvements. A statewide network model with truck and passenger vehicles will permit such traditional evaluations of:

- traffic flow and safety resulting from bridge and highway improvements,
- traffic diversions and detours,
- freight movements to and from special generators like ports and industry,
- economic impacts on cities and towns, and
- air quality impacts, especially where the statewide model merges with regional models.

A statewide model will also help address contemporary issues such as those posed by the Transportation Research Board in its Fall 2008 solicitation (NCHRP 08-74 [RFP]) for research on DOT performance measures for sustainability. Such measures may be applied "...at different scales and at different points in system planning and programming; project development, design, construction, and maintenance; and operations". Such measures may include "...wetland conservation, enhanced economic opportunity, improved air quality, reliable mobility, system preservation, accelerated project delivery, economic